SPECIAL COMMUNICATION

From the Canadian Society for Vascular Surgery

Trends in abdominal aortic aneurysm repair in the era of endovascular technology in Ontario

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Abdominal aortic aneurysm (AAA) is a common condition in the elderly population with potentially fatal outcomes. The prevalence of AAAs increases with age, reaching up to 7% in men age 55 and older. Ruptured AAAs are considered to be the 13th leading cause of death in the United States.[1]

To date, management of AAAs is limited to surgical repair. Currently, two approaches to repair of AAA are used: the classic open repair and the less invasive endovascular aneurysm repair (EVAR).

Findings from randomized clinical trials generally suggest superior minimally invasive and short-term clinical benefits for the EVAR approach relative to the classic open repair approach. Specifically, EVAR is associated with lower 30-day mortality (1.7% vs 4.7%),[2] shorter length of hospital (3.9 vs 10.3 days) and intensive care unit stay (0.5 vs 2.2 days) and less blood loss (465 mL vs 1202 mL).[3] Another randomized trial (DREAM Trial Group) reported 30-day mortality rates of 4.6% in the open repair and 1.2% in the EVAR group.[4] However, there is no clear advantage of EVAR in terms of long-term mortality or improvement in life quality.[5]

Given these benefits of EVAR relative to open repair for AAAs demonstrated in clinical trials, the use of EVAR has been growing internationally. For example, in the United States, EVAR was carried out in 72% of total AAA repairs in 2006.[6]

Canada has long been recognized as an international leader in vascular surgery; however, the rate uptake of EVAR in Canada may be considerably slower. For example, the use of EVAR has been limited by provincial funding in Ontario. According to Thomas F. Lindsay, a staff physician and vascular surgery fellowship program director at University of Toronto, Toronto, Ontario, Canada, EVAR procedures specifically are allowed in only six vascular surgery centers, two in Toronto and one in each of Ottawa, Hamilton, London, and Sudbury with public funding limiting the number of EVAR procedures in each center.

To better assess the utilization rates of EVAR and open procedures for the treatment of AAAs in Ontario, we measured the quarterly population-adjusted utilization rates of EVAR and open repair procedures in patients over the age of 45 from April 1, 2005 through March 31, 2009 using administrative claims databases.

The Canadian Institute for Health Information Discharge Abstract Database was used to determine the procedure rates. Population estimates for the study period were obtained through Statistics Canada census data. Utilization rates were projected through 2013 using the Winters method time series exponential smoothing model.[7] This study was approved by the research ethics board of Sunnybrook Health Sciences Centre.

The total number of AAA repairs remained relatively constant over the study period at seven per 100,000. The proportion of procedures attributable to EVAR increased from 9.6% in 2005 to 36.7% by the beginning of 2009 (Fig). Forecasting projections using the Winters projection model based on past trends suggest EVAR procedures to account for at least 80% of all surgical AAA repair procedures by 2012 should current trends persist and increasing funding levels and capacity continue.

Based on this analysis, the utilization rates in Ontario appear to significantly lag behind those of other countries such as 72% of AAA cases being managed through EVAR in United States by 2006[6] and Australia where approximately 75% of AAA cases were managed by EVAR by 2009.[8]

In Ontario, there are three possible reasons for delaying the adoption of EVAR including funding limitations, availability of skilled surgical staff, and capacity to train residents.

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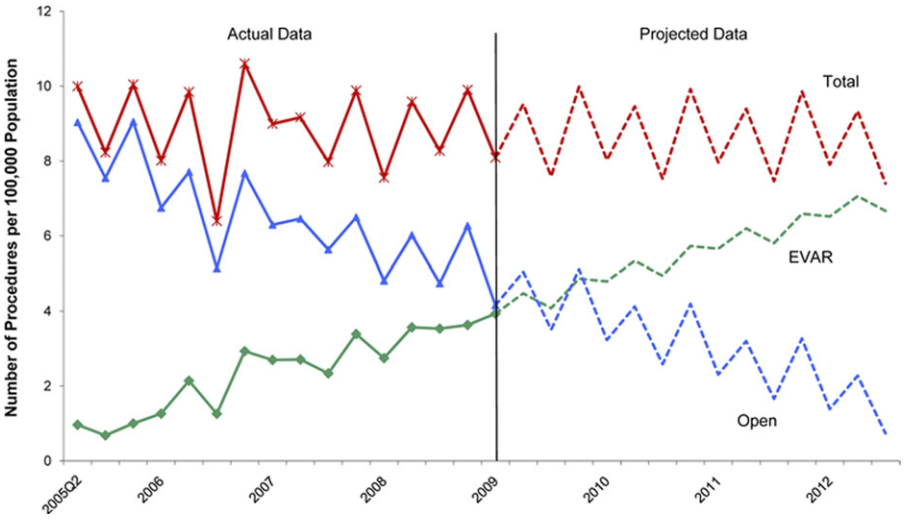

Fig. Abdominal aortic aneurysm (AAA) procedure rates in Ontario. *EVAR*, Endovascular aneurysm aneurysm.

Funding limitations assimilate the most significant factor. Endovascular procedures in general cost more than classic open surgery because of increased costs related to stents using or the need of other supplementary procedures.[9] In Ontario, EVAR service is funded in only six vascular surgery centers with a fixed limit on the number of endovascular abdominal aortic aneurysm repairs that are funded annually.

Availability of skilled surgical staff does not seem to be an important factor. Although EVAR is a relatively recent advance, data from Ontario demonstrate that vascular surgeons are qualified, skilled, and have similar outcomes to those in other countries.[10]

Training capability and capacity are not problematic, either. Canada has 10 vascular surgery training programs under the umbrella of the Royal College of Physicians and Surgeons of Canada since 1983 with four of them located in Ontario.[11] Furthermore, the involvement of vascular trainees in the endovascular technique procedures was supported by 75% of US vascular surgery program directors and Canadian program directors earlier in 1995.[12]

After analysis of the trends and projections for EVAR in Ontario, we recognize that funding is the main barrier that hampers the adoption of this new minimally invasive, life-saving technology.

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